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the Keewatin territory. The relations are illustrated by maps. 'The Use of Local Names in Geology,' C. R. Keyes. The paper is in the main a justification of the recent introduction and spread of local formational names. 'The Weathered Zone (Sangamon) between the Iowan Loess and Illinoian Till Sheet,' Frank Leverett. After an introduction describing the general relationships of the subdivisions of the glacial deposits concerned, the character, distribution and interpretation of the zone of weathered materials, called the Sangamon, are taken up. 'Studies in the Driftless Region of Wisconsin, II,' G. H. Squire. Several small areas are described in detail with sketches, and their topographical forms and superficial deposits are interpreted. 'Fucoids or Coprolites,' J. A. Udden. Fossils closely resembling the *Spirophyton*, of New York, are found in the Middle Devonian along the Mississippi River in Illinois and Iowa. Instead of fucoids, they are interpreted as coprolites from some mud-eating animals, such as sea-cucumbers. 'Zirkelite a Question of Priority,' M. E. Wadsworth. The author introduces, as in other current journals, his claims to priority in the use of the name zirkelite. Significant comments are added by one of the editors of the *Journal of Geology*. Editorials and reviews close the number.

THE March number of the *Bulletin* of the American Mathematical Society contains the following papers: 'The Relations of Analysis and Mathematical Physics,' by Professor H. Poincaré, translated by Mr. C. J. Keyser; 'The Roots of Polynomials which Satisfy Certain Linear Differential Equations of the Second Order,' by Professor Maxime Bôcher; 'Inflectional Lines, Triplets and Triangles Associated with the Plane Cubic Curve,' by Professor Henry S. White; 'On the Intersections of Plane Curves,' by Professor Charlotte Angas Scott; 'Euler's Use of  $i$  to Represent an Imaginary,' by Professor W. W. Beman; 'Note on the Roots of Bessel's Functions,' by Dr. M. B. Porter; 'Shorter Notices,' 'Notes,' and 'New Publications.'

The April *Bulletin* contains an account of the February Meeting of the Society, by the Secretary; 'The Theorems of Oscillation of Sturm and Klein (First Paper),' by Professor Maxime

Bôcher; 'Some Examples of Differential Invariants,' by Mr. Charles L. Bouton; 'On an Extension of Sylow's Theorem,' by Dr. G. A. Miller; 'Note on the Tetrahedroid,' by Dr. J. I. Hutchinson; 'Note on Integrating Factors,' by Mr. Paul Saurel; 'Early History of Galois' Theory of Equations,' by Professor James Pierpont; 'Love's Theoretical Mechanics,' by Mr. W. H. Macaulay; 'Schell's Tortuous Curves,' by Professor Alexander Ziwet; 'Page's Differential Equations,' by Professor Edgar Odell Lovett; 'Shorter Notices,' 'Notes,' and 'New Publications.'

#### SOCIETIES AND ACADEMIES.

##### AMERICAN MATHEMATICAL SOCIETY.

A REGULAR meeting of the American Mathematical Society was held at Columbia University, New York City, on Saturday, April 30th. As has now become the rule, the meeting extended through a morning and an afternoon session. In the interval a pleasant opportunity is offered to those present to lunch together in the restaurant on the grounds of the University. Thirty persons were in attendance, and thirteen papers were read, both numbers much exceeding the record of the same season in previous years. At the meeting of the Council seven persons were elected to membership in the Society, and four applications for membership were received. The By-Laws of the Society were amended to provide for life membership, the dues being fixed at \$50, exclusive of initiation fee.

The following is a list of the papers presented:

##### MORNING SESSION.

1. PROFESSOR W. F. OSGOOD: 'Example of a single-valued function with natural boundary, whose inverse is also single-valued.'
2. MR. J. K. WHITTEMORE: 'A proof of the theorem:

$$\frac{\partial^2 f(x, y)}{\partial x \partial y} = \frac{\partial^2 f(x, y)}{\partial y \partial x},$$

3. MR. H. E. HAWKES: 'The limitations of Greek arithmetic.'
4. PROFESSOR H. S. WHITE: 'The construc-

tion of special regular reticulations on a closed surface.'

5. PROFESSOR E. O. LOVETT: 'Infinitesimal transformations of concentric conics.'

6. PROFESSOR E. O. LOVETT: 'Note on infinitesimal projective transformations.'

7. PROFESSOR MAXIME BÔCHER: 'Note on Poisson's integral.'

#### AFTERNOON SESSION.

8. MR. W. M. STRONG: 'On the necessity of continuity in Euclid's geometry.'

9. PROFESSOR A. G. WEBSTER: 'Note on Stokes' theorem in curvilinear coordinates.'

10. PROFESSOR E. B. VAN VLECK: 'On the polynomial of Stieltjes.'

11. MR. G. P. STARKWEATHER: 'A solution of the biquadratic by binomial resolvents.'

12. DR. G. A. MILLER: 'On the supposed five-fold transitive function of 24 elements and  $19! \div 48$  values.'

13. DR. G. A. MILLER: 'On the Hamilton groups.'

The Summer Meeting of the Society will be held at the Institute of Technology, Boston, Mass., on Friday and Saturday, August 19th and 20th, in affiliation with the American Association for the Advancement of Science. A colloquium will be held in connection with the meeting, two courses of lectures being offered by Professor W. F. Osgood, of Harvard University, and Professor A. G. Webster, of Clark University.

F. N. COLE,  
*Secretary.*

#### THE PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 484th meeting of the Philosophical Society was held at the Cosmos Club, at 8. p. m., April 30th. The first paper was by Mr. William Eimbeck on 'Terrestrial Refraction,' as related to the determination of heights by trigonometric processes.

Conceiving refraction to depend solely upon the density of the atmosphere, he showed that it varies not only with the hour of the day, but likewise with the seasons of the year and the heights above the sea, etc. Also, that the diminution of the refraction with heights as exhibited by the coefficients for the various levels of elevation must not be neglected, as is custo-

mary in the computation of heights from zenith measures, if the utmost attainable precision is sought. On account of the decrease of atmospheric density, the refraction at a higher station is necessarily always less than at a lower station.

This is a condition, the effect of which is not eliminated by simultaneous measures of reciprocal zenith distances.

The second paper was by E. D. Preston on 'Recent Progress in Geodesy.' After a brief historical review of what has been done thus far in determining the size and shape of the earth, attention was called to some recent measurements of parallel arcs. It was pointed out that both in Europe and America the above measures indicate a smaller radius of curvature than that determined by Clarke's mean figure. The work of the International Geodetic Association was then taken up and a summary given of its recent investigations in the variations of latitude. The fact was noted that it is proposed in the near future to establish four international stations, two of which will be in the United States, and all of which will be within half a mile of the parallel  $39^{\circ} 8'$ . The most favorable conditions for successful work at these stations were described as well as the mathematical and physical reasons bearing on the choice of location.

E. D. PRESTON,  
*Secretary.*

#### THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY.

By invitation of Dr. C. F. Chandler and the authorities of Columbia University the regular meeting of the Society was held Friday evening, May 6th, at Havemeyer Hall, after a dinner in the University restaurant, at which forty-two members were present. Dr. Chandler made an address of welcome and gave a sketch of the inception and development of the Columbia School of Mines and its successor, the present 'Faculty of Applied Science.' The Chairman then made some remarks expressing appreciation of the invitation from the University, and of the interest in the Section manifested by supplying the entire program of papers, the reading of which was proceeded with as fol-

lows: 1. J. A. Mathews, 'The Action of Nitrils upon Aromatic Acids.' 2. E. H. Hodgson, 'The Determination of Sulphur in Asphalts.' 3. S. A. Tucker, 'A Few Remarks on the Persulphates.' 4. W. D. Engle, 'The Action of Metallic Thio-Cynates upon Organic Chlorhydrins.' 5. A. G. Betts, 'Alcoholic Ethers of Nitro, Amido and Oxy Benzyl Alcohol.'

Mr. Hodgson had determined the sulphur in a variety of asphalts by several well-known methods, one of which was modified by the use of sodium peroxide. He found the following amounts of sulphur and differences by the several methods:

	Nitric acid. (Carius).	Sodium. Peroxide.	Defla- gration.
Trinidad Lake.....	4.33	3.77	3.80
"    crude.....	4.10	3.33	3.2
"    refined.....	4.46	4.07	3.6
Cuban crude.....	3.61	3.10	2.8
Alcatraz crude.....	5.45	3.98	4.2
California crude.....	7.51	6.26	6.5

In order to have time to inspect the laboratories it was moved and seconded that the last three papers should be postponed to the next meeting, and after passing a vote of thanks to Dr. Chandler and the authorities of the University a tour of the chemical department laboratories was made.

DURAND WOODMAN,  
Secretary.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, MAY 10.

PROFESSOR H. A. PILSBRY spoke of certain embryonic or nepionic characters of Bulimulidæ having a bearing on the classification of the group. In the case of some of the young shells a fine grating on the upper whorls comes to a stop where the shell is hatched; in others there is no sculpturing, while in others there are zigzag or equidistant ridges with fine striæ between. These characters can be correlated with peculiarities of the soft anatomy, but not with those of the adult shell. The geographical distribution of the groups thus defined was given, and illustrative specimens of embryonal apices were shown under the microscope.

Professor Pilsbry also made a communication on the results of recent work on the mollusca of Lake Tanganyika and demonstrated the relationship of the halolimic genera to marine forms.

Mr. Joseph Willcox exhibited a fine series of *Cypræa exanthema* and *C. cervus* to sustain his opinion that these species grade into each other and that *cervus* can scarcely be considered even a variety of the other. He believed the mantle filaments of *Cypræa* have a direct influence on the formation of spots on the shell, perhaps secreting the light color to which they were due.

Professor E. G. Conklin read a paper on the environmental and sexual dimorphism of *Crepidula*. The conclusion was reached that it is a case of protandric hermaphroditism and of marked sexual dimorphism. The communication was presented for publication and will appear in the *Proceedings* with illustrations.

Papers on certain aboriginal mounds of the South Carolina coast, the Savannah River, and the Altamaha River, by Clarence B. Moore were also presented for publication and will form part of the next number of the *Journal*.

EDWARD J. NOLAN,  
Recording Secretary.

NEW BOOKS.

*Outlines of the Earth's History.* N. S. SHALER. New York, D. Appleton & Co. 1898. Pp. iv+417. \$1.75

*Brown Men and Women.* EDWARD REEVES. London, Swan, Sonnenschein & Co.; New York, The Macmillan Company. 1898. Pp. vi+294. \$3.50.

*The Story of Photography.* ALFRED T. STORY. New York, D. Appleton & Co. 1898. Pp. 169.

*Electro-Physiology.* W. BIEDERMANN; translated by FRANCES A. WELBY. London and New York, The Macmillan Company. 1898. Vol. II. Pp. vii+500. \$5.50.

*Organic Chemistry.* JOHN WADE. London, Swan, Sonnenschein & Co.; New York, The Macmillan Company. 1898. Pp. xvi+460. \$1.75.